

An Analysis of the Dimensions of Deprivation in Italy*

Una Analisi delle Dimensioni della Deprivazione in Italia

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Summary: La natura multidimensionale e temporale della deprivazione, è oggi unanimemente riconosciuta. Si presenta, quindi l'esigenza di un approccio che integri le tradizionali misure monetarie con indicatori non monetari (es. condizioni abitative, possesso di beni durevoli, difficoltà economiche per l'acquisto di cibo, vestiario, utenze ecc.). Inoltre, la disponibilità di una base di dati di tipo panel, consente di inquadrare il problema in un'ottica longitudinale. Il lavoro ha l'obiettivo di esplorare le associazioni tra indicatori monetari e non monetari e individuare particolari sottogruppi a rischio di deprivazione su una o entrambe le dimensioni. L'analisi utilizza un approccio *fuzzy* ed è basata sui dati italiani (dal 1994 al 2000) dell'indagine Panel europeo sulle famiglie.

Keywords: monetary and non-monetary dimensions of deprivation, persistent and any time deprivation, fuzzy approach, membership function, manifest and latent deprivation, panel.

1. Introduction

Until a recent past, poverty research has been associated to the argument which identifies poverty as shortage of income, consequently monetary indicators have been used to describe poor and their characteristics. Nowadays, however, multidimensional nature of poverty is unanimously well-known: it is recognised that income is an important resource, but it is not the only one. It is also important to describe the standard of living of individuals and household through a set of non-monetary indicators.

There is also another aspect of the phenomenon to take into account: deprivation may interest persons only once during the lifetime, more than once but non persistently or more than once but persistently, this means to consider the temporal dimension.

The aim of this paper is twofold: 1) to explore, in a temporal framework, the association between monetary and non-monetary indicators at a micro level, in order to detect how much individuals are deprived on both dimensions simultaneously or on one of the two dimension and 2) the subgroups of population more at risk of deprivation on both the dimensions simultaneously.

This analysis is based on Italian data of the European Community Household Panel (ECHP) from 1994 to 2000. This database is the unique Italian source which allows exploring both the dimensions of deprivation in a longitudinal perspective.

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2. The methodology: a fuzzy approach

Instead of using the traditional classification of the population into the dichotomy of at-risk or not-at-risk of deprivation, it is introduced a fuzzy approach. The at-risk of income monetary deprivation index - associated to each individual i - is related to the person's rank and share in the equivalised income distribution. Let y be the equivalised income in the ascending income distribution (applying modified-OECD equivalence scale), the membership function to the fuzzy set of monetary deprived is the following (Betti, Verma, 1998):

$$\mu(y) = (V_i)^\alpha = \left(\frac{\sum_{j=i+1}^n y_j}{\sum_{r=1}^n y_r} \right)^\alpha \quad \text{con } i = 1, \dots, (n-1); \quad V_n = 0$$

the parameter α is constructed such that for the population, the proportion of fuzzy deprived, is equal to the proportion deriving from traditional Eurostat approach to the study of monetary poverty (60 percent of the median of the equivalised income).

In order to consider the non-monetary deprivation, a set of 24 indicators was selected from ECHP. Subsequent factor analysis suggested that these indicators grouped into five dimensions: 1) basic deprivation (lack of ability to afford most basic requirements such as replacing worn-out furniture or a holiday away from home for at least once a year); 2) housing facilities (such as no indoor flushing toilet, running hot water); 3) basic items (enforced lack of basic durable such as a car, a colour television, a microwave, a dishwasher); 4) housing problems (i.e. leaking roof); 5) problems with environment (i.e. pollution, vandalism). The membership function μ for each elementary indicator is defined taking into account the individual's position in the deprivation distribution: in the specific case of a dichotomic indicator, the membership function assumes only its extremes values (0, 1). Individual indicators within each of the dimensions listed above are combined to obtain a single index describing the degree of deprivation for the dimension considered. The following formula applies (Eurostat, 2002):

$$\mu(x_d) = \frac{\sum_{j=1}^k \mu(x_{jd}) w_{jd}}{\sum_{j=1}^k w_{jd}}$$

k is the number of indicators within each dimension d and w_{jd} is the weight constructed for item j belonging to dimension d , taking into account the proportion of population deprived for the item j and the correlation with the other items of the same dimension. In a similar way a global non-monetary indicator $\mu(x)$ has been constructed, combining the 5 non-monetary indicators.

To explore the different dimensions of deprivation in a temporal framework, a panel of 10.875 individuals has been constructed¹. Using the fuzzy-sets theory, an indicator of

¹ Cases with either a missing on income or on one of the 24 non-monetary indicators were discarded.

‘persistency in deprivation’ (PERST) and one of ‘any time deprivation’ (ANY TIME) have been constructed for each individual i , both for the monetary and the non-monetary dimension, for $t=1994, \dots, 2000$, in the following way:

$$\begin{aligned} \text{PERST_monetary}_i &= \min [\mu_t(y_i)] & \text{PERST_non-monetary}_i &= \min [\mu_t(x_i)] \\ \text{ANY TIME_monetary}_i &= \max [\mu_t(y_i)] & \text{ANY TIME_non-monetary}_i &= \max [\mu_t(x_i)] \end{aligned}$$

In order to measure the different combinations of the two dimensions of deprivation at micro level, a persistent ‘manifest’ deprivation propensity of each individual i has been defined as the intersection (the smaller) of the two measures PERST_monetary_i and $\text{PERST_non-monetary}_i$. Similarly, the persistent ‘latent’ deprivation is the union (the larger) of the two measures PERST_monetary_i and $\text{PERST_non-monetary}_i$. The same has been done for the ANY TIME indicators.

$$\begin{aligned} \text{PERST_Manifest}_i &= \min [\text{PERST_monetary}_i, \text{PERST_non monetary}_i] \\ \text{PERST_Latent}_i &= \max [\text{PERST_monetary}_i, \text{PERST_non monetary}_i] \end{aligned}$$

3. Results and final considerations

The average manifest and latent deprivation propensity for both the persistent and the any time indicators are shown for different subgroups of the population as well the persistent and any time monetary and non-monetary average deprivation propensity (table 1). The less manifest and latent deprivation propensity are different, the more monetary and non-monetary deprivation regard the same individuals. Looking at the persistency in deprivation, the subgroups of population most deprived on both monetary and non-monetary dimensions simultaneously are the youngest, individuals in households with children (in particular single parent and couples with 3 or more dependent children), with a low educational achievement, in which there is only a worker or no workers and no retired, individuals in households in which the working intensity is less than a half and those living in the South of Italy. Considering the persistency in deprivation for the two dimensions separately, we observe that some groups are more deprived only on one dimension: women, for example, are more deprived than men on the monetary dimension, but are quite the same on the non-monetary one, as well the people aged 65 or more are more monetary deprived than the total, while their non-monetary deprivation is equal to the total.

As regards the any time comparison between manifest and latent deprivation, that explores the risk of deprivation for at least one year from 1994 to 2000, besides the subgroups of population listed before, also the singles aged 65 or more result deprived on both dimensions.

In summary, as results from other studies (i.e. Whelan, Layte, Maître, 2003, based on a non fuzzy approach), monetary and non-monetary deprivation indicators provide rather different types of information that can be fruitfully combined to explore the population subgroups subject to deprivation (but not necessarily on both dimensions), and to deprivation at some time (but not necessarily persistently) over the seven year period.

Table 1: Persistent and any time deprivation indexes - Italy 1994-2000

	PERST				ANY TIME			
	monetary	non monetary	MANIFEST	LATENT	monetary	non monetary	MANIFEST	LATENT
Gender								
Men	0,048	0,051	0,019	0,080	0,370	0,365	0,215	0,520
Women	0,052	0,053	0,020	0,085	0,377	0,368	0,219	0,525
Age								
Less than 16 years	0,066	0,057	0,026	0,097	0,437	0,378	0,256	0,558
16-24 years	0,058	0,060	0,023	0,095	0,438	0,393	0,253	0,579
25-49 years	0,041	0,048	0,017	0,073	0,343	0,349	0,197	0,495
50-64 years	0,040	0,050	0,014	0,075	0,332	0,367	0,195	0,504
65 years or more	0,057	0,052	0,020	0,089	0,364	0,375	0,214	0,525
Geographic zone								
North	0,017	0,026	0,004	0,039	0,244	0,293	0,127	0,410
Center	0,030	0,043	0,010	0,064	0,351	0,333	0,190	0,494
South	0,102	0,089	0,044	0,148	0,546	0,479	0,345	0,681
Household typology								
1-person household under 30	0,000	0,043	0,000	0,043	0,318	0,483	0,218	0,584
1-person household aged 30-64	0,040	0,053	0,014	0,080	0,276	0,409	0,183	0,502
1-person household aged 65 or more	0,103	0,071	0,032	0,143	0,456	0,455	0,289	0,622
2 adults without dependent child with at least one person aged 65 or more	0,047	0,046	0,015	0,077	0,327	0,335	0,184	0,479
2 adults without dependent child with both under 65	0,016	0,039	0,009	0,046	0,222	0,306	0,122	0,407
Other household without dependent children	0,025	0,048	0,009	0,063	0,289	0,362	0,172	0,480
Single parents with at least 1 dependent child	0,053	0,068	0,026	0,096	0,457	0,404	0,283	0,578
2 adults with 1 dependent child	0,032	0,037	0,012	0,057	0,281	0,326	0,157	0,449
2 adults with 2 dependent children	0,041	0,042	0,016	0,066	0,365	0,311	0,196	0,480
2 adults with 3 or more dependent children	0,104	0,064	0,038	0,130	0,528	0,400	0,300	0,627
Other household with dependent children	0,071	0,069	0,030	0,111	0,490	0,430	0,298	0,622
Household's educational achievement*								
High	0,017	0,030	0,006	0,041	0,187	0,263	0,098	0,351
Middle	0,036	0,041	0,013	0,064	0,336	0,333	0,182	0,486
Low	0,080	0,074	0,033	0,121	0,491	0,449	0,306	0,633
Household's working situation*								
2 or more workers	0,015	0,038	0,007	0,046	0,247	0,323	0,143	0,427
1 worker	0,065	0,059	0,025	0,098	0,474	0,391	0,272	0,594
No workers, at least 1 retired	0,081	0,059	0,027	0,113	0,412	0,376	0,233	0,555
No workers, no retired	0,255	0,172	0,112	0,315	0,806	0,703	0,572	0,938
Household's working intensity*								
none	0,123	0,087	0,049	0,161	0,509	0,431	0,301	0,639
>0 e <=0.5	0,072	0,066	0,028	0,110	0,506	0,411	0,297	0,620
>0.5 e <1	0,023	0,040	0,011	0,052	0,316	0,364	0,187	0,494
1	0,009	0,028	0,003	0,034	0,184	0,285	0,098	0,371
TOTAL	0,050	0,052	0,019	0,082	0,373	0,367	0,217	0,523

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